

A CONTRIBUTION TOWARDS A VASCULAR FLORA OF THE GREAT DISMAL SWAMP

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This flora is an enumeration of the vascular plants growing without cultivation in the Great Dismal Swamp. It is hoped that this work will be of value to the rapidly increasing number of persons visiting the swamp, particularly since the establishment of the Dismal Swamp National Wildlife Refuge in 1973. Great pains have been taken to ensure completeness of the inventory presented here. Yet, the Dismal Swamp is difficult to botanize, and additional species will undoubtedly be added to the present list. Previous botanical work in the swamp is listed in Kirk *et al.* (in press).

LOCATION AND EXTENT OF AREA

The Great Dismal Swamp, which occupies about 104,000 ha. of North Carolina and Virginia (Figure 1), is one of the largest remaining swamp forests on the Coastal Plain. Although the swamp is considered to be centered around Lake Drummond in the Virginia cities of Suffolk and Chesapeake, it extends into the North Carolina counties of Currituck, Camden, Perquimans, Gates, and Pasquotank. Except for the western edge, which is delimited by the Suffolk Escarpment (Henry, 1970), the boundaries of the swamp are not sharply defined.

TOPOGRAPHY AND DRAINAGE

The Dismal Swamp is situated on a low, poorly drained flat marine terrace which ranges from 4.5 to 7 m. above sea level (Wingo, 1949). Drainage in the swamp is largely controlled by an extensive system of ditches constructed over the last two hundred years. Four major ditches were constructed in the eighteenth and nineteenth centuries. The oldest (Washington Ditch) flows into Lake Drummond from the west. Feeder Ditch flows out of

¹National Science Foundation Undergraduate Research Participant, summer 1975.

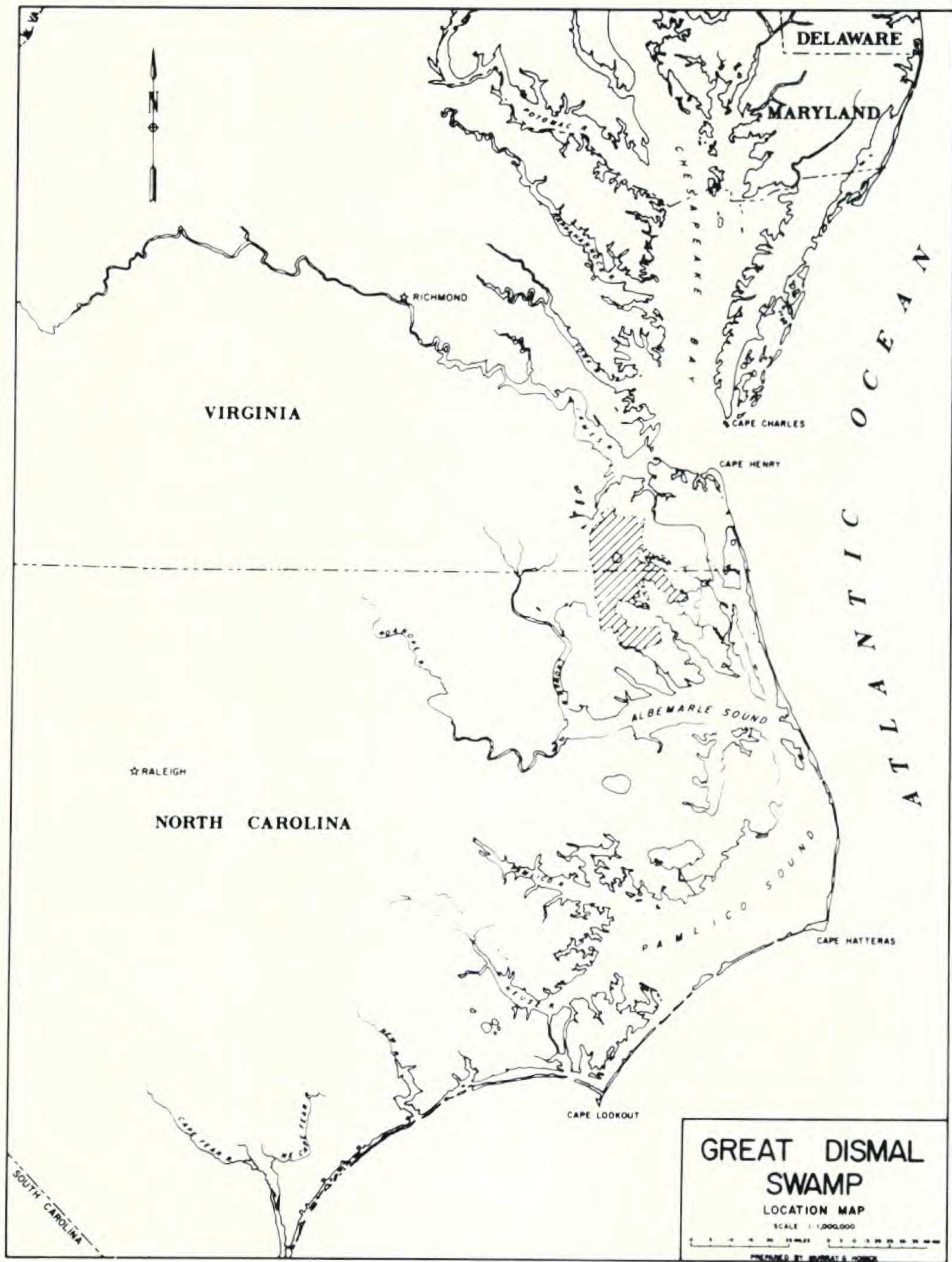


Figure 1. General location of the Great Dismal Swamp in Virginia-North Carolina.

Lake Drummond into Dismal Swamp Canal and thence into Albemarle Sound via the Pasquotank River. Riddick Ditch flows into the lake from the south, and Jericho Ditch enters the lake from the northwest (Reid, 1952). With the exception of Portsmouth Ditch (dug in the early 1800's) most other ditches were constructed during the twentieth century. Drainage is partially regulated by a system of control gates. The Northwest River (draining to the southeast) and the Pasquotank River probably were the major outflows of the original drainage.

SOILS

Most of the soils of the swamp are highly organic and very acidic. Inorganic soils include sand, silt, and clay deposited as low terraces and fluvial silts, and clays extending from the Suffolk Escarpment (Henry, 1970).

The most extensive soil type is mucky peat which ranges in depth from 1 to 4.5 m. and occupies about 75% of the total swamp area. This soil is intermediate between peat in which vegetable materials are recognizable and muck in which they are not. The deepest deposits lie to the north of Lake Drummond. In many areas peat depth has been reduced by fire (Henry, 1970). Shallow mucky peat over loam and over sand are other soil types. Mucky peat gradually intergrades with poorly drained inorganic soils at some places.

The history of the development of the peat and other underlying substrates has been discussed in detail by Whitehead (1972) who postulated that the underlying sediment was dissected by meandering, slow-flowing streams. Peat deposition seems to have begun in these streams and eventually to have overtopped the interfluvial areas perhaps in the manner of a blanket bog.

CLIMATE

The region is characterized by mild winters and long humid summers. Mean temperatures, based on an 85 year record for Norfolk County, are: winter, 6.5°C.; spring, 17.3°C.; summer, 25.3°C.; and fall, 17.3°C. The average growing season is 237 days, and the average annual precipitation for Wallaceton on the swamp's eastern edge is 131.25 cm. Rainfall is most abundant during the growing season.

VEGETATIONAL HISTORY

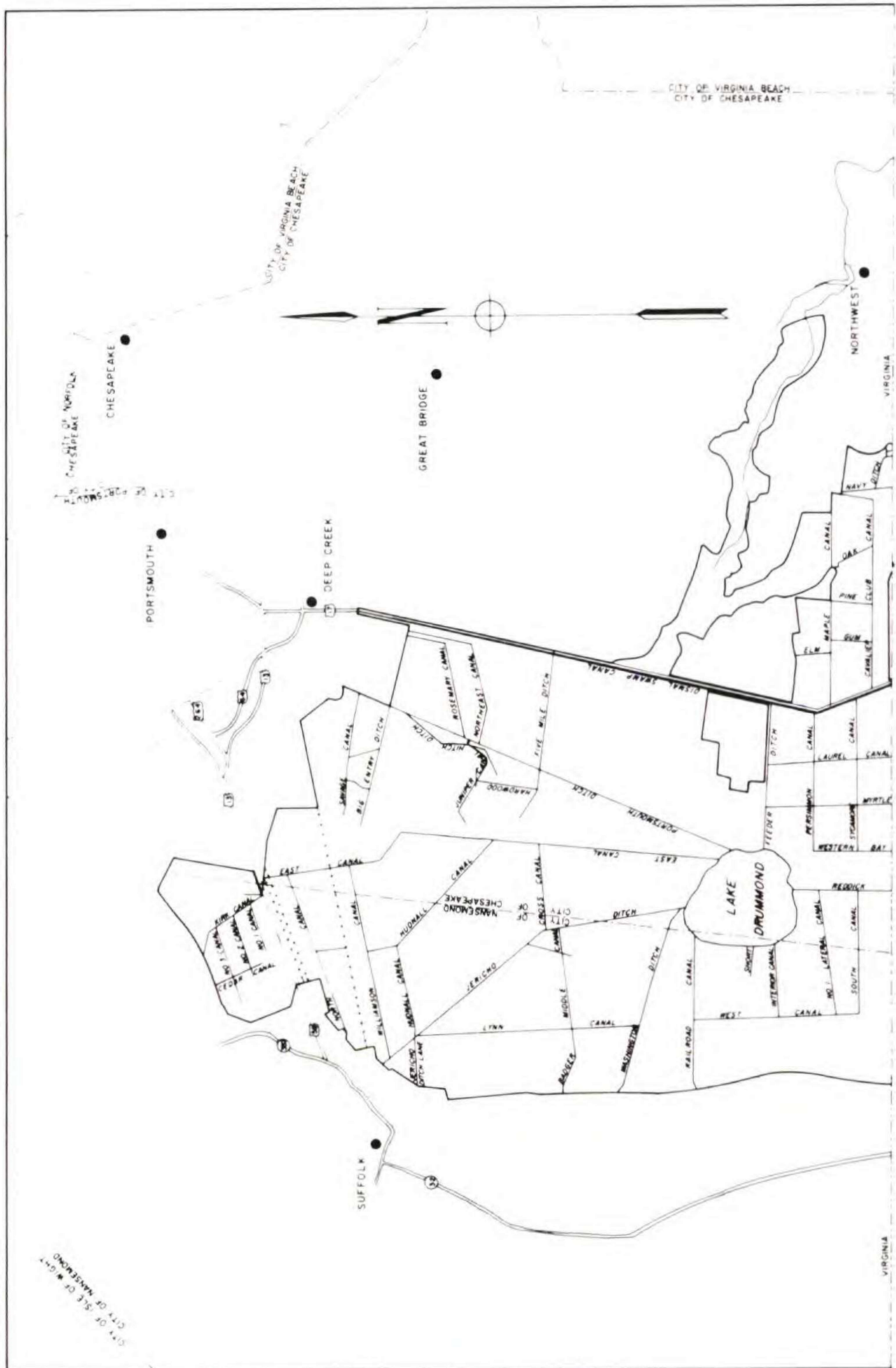
The vegetational history of the Dismal Swamp as revealed by palynological studies (Cocke, 1928; Whitehead, 1972) can be summarized as follows: 1) 14,000–10,000 B.P. — exposure of Dismal Swamp terrace, cutting by meandering streams, and colonization by marsh communities with boreal forest on the interfluvials; 2) 10,000–8,000 B.P. — peat accumulation continues, interfluvial vegetation a northern hardwoods-mixed forest association; 3) 8,000–4,000 B.P. — oak hickory forest association and lowland forest species; and 4) 4,000–300 B.P. — gum-cypress forest. Though greatly simplified, these major trends correspond to the gradual climatic warming which has occurred during the last 14,000 years.

Kearney (1901) appears to be the first to execute an extensive study of the Dismal Swamp. Col. William Byrd's descriptions (in Kearney, 1901) suggest that extensive stands of cypress (*Taxodium distichum*) interspersed by blow-downs and various stages of secondary succession occurred in the 1700's. The first timber to be removed seems to have been cypress which often became replaced by single-aged stands of Atlantic white cedar (*Chamaecyparis thyoides*) also known as "juniper" (Kearney, 1901). Subsequently cedar was extensively cut (Brown, 1970).

Kearney (1901) described two hygic forest communities. "Dark Swamp" included *Nyssa sylvatica*, *Taxodium distichum*, and *Acer rubrum*. Also mentioned were *Pinus taeda*, which was especially important on higher ground near the border of the swamp, and *Fraxinus caroliniana* and *Quercus phellos*. Important smaller trees listed by Kearney were *Magnolia virginiana*, *Persea borbonia*, *Carpinus caroliniana*, *Salix nigra*, *Alnus rugosa*, and *Populus heterophylla*. *Liriodendron tulipifera* and *Liquidambar styraciflua* were associated with *Pinus taeda* at the edge of the swamp.

"Light Swamp" was divided into the following four associations: 1) "juniper," i.e. *Chamaecyparis* forest; 2) Ericaceae; 3) *Arundinaria gigantea*; and 4) *Woodwardia* (*Anchistea*) — *Sphagnum*.

"Juniper" forest association occurred most often at the periphery of the swamp (Kearney, 1901) with *Chamaecyparis thyoides* dominant. By 1899 much of the extensive "juniper" forest had been commercially cut, and although some dense "juniper" forest stands remained, most were scattered through a matrix of other species. Where "juniper" was cut, populations of *Pinus taeda*, *Magnolia virginiana*, *Persea borbonia*, *Ilex opaca*, *Acer rubrum*, and *Nyssa*



sylvatica expanded. On better drained soils *Quercus nigra*, *Q. michauxii*, and *Fagus grandifolia* replaced "juniper" forest.

The shrub association occurred in clear-cut areas and in areas with scattered regeneration. The most important species cited by Kearney (1901) were: *Clethra alnifolia*, *Itea virginica*, *Lyonia ligustrina*, *L. lucida*, *Leucothoë racemosa*, *Ilex glabra*, *Azalea viscosa*, and *Vaccinium corymbosum*. This association was described by Kearney (1901) as ". . . rapidly increasing in the interior of the Dismal Swamp, where it is said to have been once almost unknown." Today extensive areas of a holly-pond pine community occur in extreme southern portions of Virginia and northern North Carolina. The dominants appear to differ from those described by Kearney since *Ilex glabra* rather than *Clethra alnifolia* contributes most to this association's physiognomy.

The *Arundinaria* association was described as covering extensive areas in nearly pure stands. This association is at present of isolated occurrence.

Kearney's *Woodwardia* — *Sphagnum* association is not obvious at the present time.

PRESENT VEGETATION

Until 1937 approximately 8,000 ha. of virgin timber remained in the southwest portion of the swamp in Virginia; now practically none exists. Recent studies on the vegetation of the Great Dismal Swamp (Levy & Walker, in press) have shown that its composition has been greatly altered in the past 75 years. Comparison of the current composition of the understory and overstory with historical descriptions documents a strong successional trend to more mesic, less swamp-like conditions.

The present vegetation of the Dismal Swamp is composed of several community types. Almost pure stands of *Acer rubrum* and *Nyssa sylvatica* occur on peat throughout the swamp. A few individuals of *Chamaecyparis thyoides* are found in this association, which suggests that certain areas were once selectively cut for "juniper." Those sites with less peat and some mineral soil support a mixed deciduous forest, which shows less evidence of recent disturbance. *Acer rubrum* and *Nyssa sylvatica* are common species but are particularly abundant on thicker peat deposits. Species of *Fraxinus* are often co-dominant in wetter areas and *Liquidambar styraciflua* and *Pinus taeda* are co-dominants in relatively drier areas.

Future trends in the vegetation, as indicated by sapling composition, suggest a continuum with *Fraxinus* species becoming more important in wetter areas. *Ilex opaca*, *Nyssa sylvatica*, and *Persea borbonia* are increasing in areas having fluctuation between wet and dry extremes. *Acer rubrum* appears to be increasing in importance through the swamp in both wetter and drier situations. Stands currently dominated by *Chamaecyparis thyoides* may eventually be eliminated from the swamp due to the lack of fire.

Included among the collection sites are a number of disturbed areas with weeds. These areas include a borrow pit, an abandoned home site, ditch banks, cut over forest stands and burns.

“Mesic islands” represent areas of relatively high ground surrounded by swamp. In general these areas tend to be near the western edge of the swamp. Among the canopy species are *Fagus grandifolia*, *Quercus nigra*, *Q. phellos*, *Q. laurifolia*, *Q. velutina* and *Q. michauxii*. Often present are *Ostrya virginiana*, *Carpinus caroliniana*, *Ulmus americana*, *Liriodendron tulipifera* and *Fraxinus americana*. The ubiquitous *Acer rubrum* is also important. The North Carolina islands are especially noticeable on high level infrared aerial photographs. Among the unusual species found in these mesic areas are *Stewartia malacodendron* and *Trillium pusillum*.

Ditches and ponds are characterized by tannin-stained, dark, low pH (2–5.8) “juniper” water. Characteristic plants are species of *Utricularia*, *Callitriche heterophylla*, *Ludwigia palustris*, *Proserpinaca palustris*, and *Juncus repens*.

METHODS AND MATERIALS

Our data is based on field work conducted from July, 1973, to August, 1976. Collection data on some species was obtained from herbarium specimens at the U. S. National Herbarium (US). Collections are deposited in the herbarium of Old Dominion University (ODU) with duplicates of most specimens at NCU and VPI. The arrangements of families and nomenclature generally follow Radford *et al.* (1968). No attempt has been made to distinguish species which may have been introduced.

In order to provide accurate locality data, we have listed representative collection sites. The collection site of each species may be determined by the letter-number code which follows the species name.

KEY TO COLLECTION SITES

1. City of Suffolk (Nansemond), Virginia
 - A. Five year old sweet gum-red maple stand just south of Seaboard Coast-line Railroad, 0.5 mi. W. of Chesapeake city limits.
 - B. Borrow pit, Jericho Ditch Lane at escarpment.
 - C. Beech-maple stand and surrounding low areas on Jericho Ditch, 0.5 mi. S. of Williamson Ditch.
 - D. Abandoned cabin site at junction of Jericho Ditch and Jericho Ditch Lane.
 - E. Gum forest, northeast of the junction of Lynn and Washington Ditches.
 - F. Banks and waters of Washington Ditch.
 - G. Lake Drummond at Washington Ditch.
 - H. Banks and waters of West Ditch.
 - I. Mature gum-poplar forest along west edge of Lake Drummond just south of West Ditch.
 - J. Roadsides and shallow water near road 604, 6.4 mi. N. of state line.
 - K. Beech-pine forest east of road 604, 2.4 mi. N. of state line.
 - L. Cutover forest, 2 mi. W. of Old Norfolk Road, southeast of Driver.
 - M. Power line right-of-way west of Jericho Ditch.
2. City of Chesapeake, Virginia
 - A. Banks and waters of Dismal Swamp Canal, 1 mi. N. of state line.
 - B. Open, burned area 1 mi. W. of U.S. 17, 1 mi. S. of Feeder Ditch.
 - C. Mature gum-poplar forest on east edge of Lake Drummond south of Portsmouth Ditch.
 - D. Waters of eastern portion of Lake Drummond between East Ditch and Lake Ditch.
 - E. Cypress-tupelo forest along Portsmouth Ditch just south of Big Entry Ditch.
3. Gates County, North Carolina
 - A. Marsh north of Hamburg Ditch, 1 mi. E. of road 1332.
 - B. "Mesic island" north of Hamburg Ditch, 1.5 mi. E. of road 1332.
 - C. Cypress-tupelo forest, south of Hamburg Ditch, just E. of escarpment.
 - D. "Mesic island," 1.5 mi. N. of highway 158, just E. of Pasquotank County line.
 - E. Cypress-tupelo forest just S. of U.S. 158, 1 mi. E. of road 1002.
 - F. Ditch and surrounding burned area north of U.S. 158, just E. of county line.
4. Camden County, North Carolina
 - A. Cutover Atlantic white cedar stand, west of Western Boundary Ditch, just south of state line.
 - B. Cypress-tupelo swamp at end of road 1219, four miles northwest of South Mills.
 - C. Shallow water and margins of small stream at U.S. 17 bridge, 1.7 mi. S. of South Mills.
 - D. Undeveloped state park just south of state line and west of U.S. 17.
5. Pasquotank County, North Carolina
 - A. Shallow water and margins of Pasquotank River at the end of road 1361.
 - B. Pine-maple forest at end of road 1360.

CATALOG OF SPECIES

LYCOPODIACEAE

- Lycopodium obscurum* L. Rare. Small population. 1A.
L. complanatum Fern. Rare. Small population. 1A.

SELAGINELLACEAE

- Selaginella apoda* (L.) Spring. Damp roadside. 1K.

OPHIOGLOSSACEAE

- Botrychium dissectum* Spreng. Infrequent. Drier sites. North of Washington Ditch at west edge of refuge. Also 3D.

OSMUNDACEAE

- Osmunda cinnamomea* L. Common in moist soil. 1A, 1C, 1E, 1I, 1K, 2B, 3C, and 4B.
O. regalis var. *spectabilis* (Willd.) Gray. Common in moist soil. 1A, 1E, 1G, 1H, 1I, 1J, 2A, 2D, 3A, 3C, 4B, 4C, and 5A.

PTERIDACEAE

- Pteridium aquilinum* (L.) Kuhn. Infrequent along roadsides of Jericho, Interior, and Middle Ditches.

ASPIDIACEAE

- Athyrium asplenoides* (Michx.) Eat. Infrequent. Roadside Jericho Ditch. 3B.
Dennstaedtia punctilobula (Michx.) Moore. Rare. Roadside of Middle Ditch.
Dryopteris celsa (Palmer) Small. Infrequent. Cypress-gum forests. 2C, 3C, 3D, and 4B.
D. cristata (L.) Gray. Rare. 3C and 4B.
D. intermedia (Willd.) Gray. Infrequent. Gum forest. 2C, 3C, and 3D.
D. marginalis (L.) Gray. "Nansemond County." *Palmer 256* (US).
D. spinulosa (Muell.) Watt. Frequent. 1E, 1I, 2C, 3C, and 4B.
Polystichum acrostichoides (Michx.) Schott. Rare. Beech forest. 3B.
Thelypteris noveboracensis (L.) Nieuw. Rare. Roadside of Jericho Ditch.
T. palustris Schott. Rare. Marsh. 3A.

BLECHNACEAE

Anchistea virginica (L.) Presl. Common and abundant. Along roads. Also 1E, 1F, 1H, 1I, 1J, 2A, 2E, 3A, 3C, 4B, 4C, and 5A.

Lorinseria areolata (L.) Presl. Common and abundant. 1E, 1F, 1H, 1I, 1J, 2C, 3A, 3C, and 5A.

ASPLENIACEAE

Asplenium platyneuron (L.) Oakes. Frequent in a variety of habitats. 1A, 1E, 1I, 1K, 1C, 3B, and 4B.

POLYPODIACEAE

Polypodium polypodioides (L.) Watt. Infrequent on tree trunks. Hamburg Ditch. 1C and 5A.

AZOLLACEAE

Azolla caroliniana Willd. Rare. Margins of stream. 4C.

GYMNOSPERMS

PINACEAE

Pinus serotina Michx. Frequent but scattered. Roadsides. 2B and 4A.

P. taeda L. Common on drier sites. Roadsides. Jericho, Lynn, and Washington Ditches. Also 1A, 1K, 3B, 3D, 3E, and 5B.

TAXODIACEAE

Taxodium distichum (L.) Rich. Common. 1C, 1E, 1F, 1G, 1H, 1I, 1J, 2D, 2E, 3C, 3E, 4B, 4C, 5A, and throughout the swamp.

CUPRESSACEAE

Chamaecyparis thyoides (L.) BSP. Common but scattered. Southeast of fire tower, 4A. Several sizable stands south of Lake Drummond.

ANGIOSPERMS

MONOCOTS

TYPHACEAE

Typha latifolia L. Rare. 1B and 3A.

SPARGANIACEAE

Sparganium americanum Nutt. In flowing water of most ditches.

POTAMOGETONACEAE

Potamogeton diversifolius Raf. Rare. Shallow, flowing water of Hamburg Ditch.

P. pulcher Tuckerm. Rare. Standing water. 1J and 3A.

POACEAE

Arundinaria gigantea (Walt.) Muhl. Common and abundant especially in burned areas. 1A, 1C, 1E, 1F, 1G, 1H, 1I, 1K, 1L, 2A, 2B, 2E, 3A, 3C, 4B, and 5B.

Agrostis stolonifera L. Rare. Weedy area. 1D.

Alopecurus carolinianus Walt. Rare. Roadside. 1D.

Andropogon virginicus L. Infrequent. Open weedy areas. 1L, 1M, 2B, and 4A.

Briza minor L. Rare. Roadside. 1D.

Bromus catharticus Vahl. Infrequent. Norfolk and Western Railroad right-of-way. 1D.

B. commutatus Schrader. Rare. 1M.

B. japonicus Thunb. Infrequent. Norfolk and Western Railroad right-of-way. 1D.

B. secalinus L. Rare. 3F.

Calamagrostis cinnoides (Muhl.) Bart. Rare. Roadside, 1J. Marsh, 3A.

Dactylis glomerata L. Rare. Open, disturbed area. 1D.

Echinochloa crusgalli (L.) Beauv. Rare. 1M.

E. walteri (Pursh) Heller. Rare. 1M.

Elymus virginicus L. Rare. 1M.

Eragrostis hirsuta (Michx.) Nees. Rare. Open, disturbed area. 1D.

Erianthus giganteus (Walt.) Muhl. Infrequent. Scattered along roads throughout the swamp. Also Norfolk and Western Railroad right-of-way. 1M.

Festuca myuros L. Rare. Weedy field. 1D.

F. octoflora Walt. Rare. Weedy field. 1D.

Glyceria striata (Lam.) Hitch. Rare. Swamp forest. 1E.

Holcus lanatus L. Rare. 1E.

Hordeum pusillum Nutt. Rare. Weed in field. 1D.

Leersia oryzoides (L.) Swartz. Infrequent. Roadside. 1J and 3F.

L. virginica Willd. Infrequent. Roadside. 1J, swamp forest, 1E.

Lolium multiflorum Lam. Infrequent. Jericho Ditch at Williamson Ditch. Roadsides of Interior Ditch and Hamburg Ditch.

- Microstegium vimineum* (Trin.) Cam. Rare. Field near fire tower.
Panicum anceps Michx. Infrequent. Cutover and burned areas.
 1M and 3F.
P. clandestinum L. Rare. 3F.
P. dichotomum L. Beech forest. 3D.
P. dichotomiflorum Michx. Infrequent. Norfolk and Western
 Railroad right-of-way. Also 1M.
P. hians Ell. Rare. Old road. 1L.
P. scoparium Lam. Common. Essentially all roadsides.
P. verrucosum Muhl. Abundant in burned area along U.S. 158
 but not collected elsewhere.
P. virgatum L. Rare. Burned area. 3F.
Paspalum dilatatum Poir. Rare. Grassy field near fire tower.
P. dissectum L. Rare. Roadside. 1J.
P. laeve Michx. Rare. Power line cut. 1M.
Phragmites communis Trin. Rare. One small stand along Cora-
 peake Ditch.
Poa autumnalis Muhl. ex Ell. Rare. Woods. 1C.
Setaria glauca (L.) Beauv. Rare. 1M.
S. magna Grisebach. Rare. 3F.
Sphenopholis obtusata (Michx.) Scrib. Rare. Marsh. 3A.
Sporobolus poiretii (R. & S) Hitch. Rare. Roadside. 1D.
Uniola laxa (L.) BSP. Rare. Sandy soil. 1C and 3B.

CYPERACEAE

- Carex abscondita* Mackenzie. Rare. 3C.
C. alata T & G. Frequent. Roadsides. Ditch banks. 1F, 1H, 1J,
 1M, 2B, 3F, and 4A.
C. blanda Dew. Rare. Beech forests. 1C and 3B.
C. debilis Michx. Rare. Gum-cypress forest. 3E.
C. emmonsii Dew. Rare. Roadside. 1J.
C. folliculata L. Rare. Ditch bank at junction of Lynn and Bad-
 ger Ditches.
C. gigantea Rudge. Frequent. Gum-cypress forests. 1E, 1J, 2E,
 3C, 3E, and 4B.
C. joori Bailey. Rare. Roadside. 1J.
C. lurida Wahlenb. Common. Borders of intermittent pools and
 other wet areas. 1C, 1E, 1J, 1M, 3C, 3E, and 3F.
C. swanii (Fern.) Mackenz. Rare. Roadside. Middle Ditch north
 of Lynn Ditch.

- Cyperus erythrorhizos* Muhl. Rare. 1M.
C. rivularis Kunth. Rare. Margin of stream. 4C.
C. strigosus L. Rare. 1M.
Dulichium arundinaceum (L.) Britt. Infrequent. Low roadside. Jericho Ditch at Lynn Ditch. Shallow water of Lynn Ditch. 3A and 1 M.
Eleocharis baldwinii (Torr.) Chapm. Rare. Margins of flowing water. 3F.
E. microcarpa Torr. Rare. Margin of ditch. 3F.
E. obtusa (Willd.) Schultes. Rare. 1M.
E. tenuis (Willd.) Schultes. Rare. Shallow water of Hamburg Ditch near 3A.
E. tuberosa (Michx.) R & S. Margins of small pools. 1M and 3F.
Eriophorum virginicum L. Abundant in sphagnous bog. 4 mi. w. of East Ditch on North Ditch.
Fuirena squarrosa Michx. Rare. Margins of ditch. 4C and 3F.
Rhynchospora corniculata (L.) Gray. Infrequent. Wet roadside. 1J and 1F.
Scirpus cyperinus (L.) Kunth. Common and abundant in open ditches and along roadsides. 1B, 1F, 1H, 1J, 1M, 2B, 3A, 3F, 4C, and 5A.

ARACEAE

- Arisaema triphyllum* (L.) Schott. Infrequent. 1E. and 3C.
Orontium aquaticum L. Rare. Swamp forest and margin of marsh. 3A.
Peltandra virginica (L.) Schott & Endl. Rare. Margin of marsh. 3A.

LEMNACEAE

- Lemna valdiviana* Phil. Infrequent. Quiet water. 1F and 4C. Borrow pit on Jericho Ditch Lane.
Spirodela oligorrhiza (L.) Schleid. Infrequent. Floating on quiet water. 1F and 4C. Portions of Jericho and Hamburg Ditches.
Wolffia columbiana Karst. Infrequent. Quiet water, 4C. Also borrow pit on Jericho Ditch Lane.
Wolffiella floridana (J. D. Sm.) C. H. Thompson. Infrequent. Floating just beneath surface of quiet water, 4C. Borrow pit on Jericho Ditch Lane.

XYRIDACEAE

Xyris ambigua Beyrich. Rare. Open, sunny roadside. Corapeake Ditch.

BROMELIACEAE

Tillandsia usneoides L. Infrequent. On trees in Lake Drummond, 2D; 5A.

COMMELINACEAE

Commelina virginica L. Infrequent. Roadsides and ditches. Banks in full sun. 1F, 1H, 1J, and 2A.

PONTEDERIACEAE

Pontederia cordata L. Rare. Shallow ditch at margin of marsh. 3A.

JUNCACEAE

Juncus bufonis L. Rare. Margin of small stream. 4C.

J. effusus L. Common. Essentially any open wet area. 1B, 1F, 1G, 1H, 1J, 3A, 3C, 3F, 4B, and 5A.

J. repens Michx. Infrequent. Shallow water and shores, 1J and 4C. Shores of Lake Drummond where it is the only submergent vascular plant.

J. tenuis Willd. Infrequent. Roadsides. 1J and 1M.

Luzula multiflora (Retz.) Lejeune. Infrequent. Beech forests. 1C, 1K, and 3D.

LILIACEAE

Smilax rotundifolia L. Ubiquitous; in essentially any open area.

S. glauca Walt. Ubiquitous; in essentially any open area.

S. laurifolia L. Ubiquitous; in essentially any open area.

S. walteri Pursh. Rare. Open roadsides. 4C.

Trillium pusillum Michx. Rare. Beech forest. 1C.

Hemerocallis fulva L. Rare. Roadside. Washington Ditch.

Medeola virginiana L. Infrequent. Beech forests. 1C, 1K, and 3B.

IRIDACEAE

Sisyrinchium angustifolium Miller. Infrequent. Roadsides. Jericho Ditch and Interior Ditch.

Iris virginica L. Rare. Marsh. 3A.

ORCHIDACEAE

Cypripedium acaule Ait. Rare. Beech forest. 1K.

Listera australis Lindl. Infrequent. Swamp forest, 2E. Beech forest, 1K.

Goodyera pubescens (Willd.) R. Brown. Infrequent. Beech forests. 1C, 1K, and 3B.

Tipularia discolor (Pursh) Nutt. Infrequent. Beech forest. 1C and 3B.

Habenaria clavellata (Michx.) Spr. "Great Dismal Swamp," Kearney 1648 (US).

DICOTS

SAURURACEAE

Saururus cernuus L. Common. In standing water. 1F, 1G, 1H, 1J, 2A, 2D, 3F, 4C, 4B, and 5A.

SALICACEAE

Salix nigra Marsh. Infrequent. Stream and ditch margins. 1F, 2A, and 3F.

Populus deltoides Marsh. Single tree along Laurel Ditch at state line.

P. heterophylla L. Common. Swamp forests. 1E, 1I, 1J, 1L, 2E, 3C, 3E, 4C, and 5A.

MYRICACEAE

Myrica cerifera L. Common. Roadsides along Corapeake Ditch.

BETULACEAE

Alnus serrulata (Ait.) Willd. Frequent. Ditch banks and margins of small streams. 1G, 1H, 2D, 3F, 1J, and 4C.

Betula nigra L. Rare. Low woods. 2E.

Carpinus caroliniana Walt. Infrequent. Beech stands. 1C, 1K, 3B, and 3D.

Ostrya virginiana (Mill) K. Koch. Infrequent. Beech stands. 1C, 1K, 3B, and 3D.

FAGACEAE

Castanea pumila (L.) Miller. Rare. One tree along Jericho Ditch near Williamson Ditch and one on north side of Hwy 460.

Fagus grandifolia Ehrh. Infrequent. Usually associated with sandy soils. 1C, 1K, 3B, and 3D.

Quercus falcata Michx. var. *pagodaefolia* Ell. Infrequent. 1C, 1K, 1E, 1F, 4D, and 5B.

Q. laurifolia Michx. Frequent. 1I, 2C, 3C, 4B, and 4D.

Q. lyrata Walter. Infrequent. 1J and 1K.

Q. marilandica Muenchh. Single tree along Weyerhaeuser Ditch 4.

Q. michauxii Nutt. Common throughout the swamp. 1A, 1C, 1E, 1I, 2C, 2E, 3C, 3E, 4B, and 5A.

Q. nigra L. Common. Drier areas. 1C, 1E, 1I, 1K, 2A, 2E, 3C, 3E, 4B, and 5A.

Q. velutina Lam. Rare. Roadside. Jericho Ditch.

ULMACEAE

Ulmus americana L. Rare. Roadside. Jericho Ditch.

MORACEAE

Morus rubra L. Rare. Edge of Jericho Ditch Lane.

M. alba L. Rare. Edge of Jericho Ditch Lane.

URTICACEAE

Boehmeria cylindrica (L.) Swartz. Common in open, wet areas. 1E, 1F, 1G, 1H, 1J, 2A, 3A, 3F, 4B, 4C, 4D, and 5A.

LORANTHACEAE

Phoradendron serotinum (Raf.) M. C. Johnston. Common and abundant on a variety of trees (but favoring red maple) throughout the swamp.

POLYGONACEAE

Rumex crispus L. Infrequent. Roadside weed. Railroad Ditch, Interior Ditch, West Ditch, and probably elsewhere.

R. conglomeratus Murray. Abundant along most roads throughout the swamp.

Tovara virginiana (L.) Raf. Common. Low woods. 1E, 2A, 2E, 3C, 3E, 3F, 4B, and 5A.

Polygonum hydropiperoides Michx. Common in wet situations. 1F, 1G, 1H, 1J, 2D, 3F, 4C and 5A.

P. pennsylvanicum L. Common in wet situations. 1F, 1G, 1H, 2D, 3F, 4C, and 5A.

P. punctatum L. Rare. Margin of ditch. 3F.

P. sagittatum L. Infrequent. Open damp roadside, 1J; burned area, 3F.

CHENOPODIACEAE

Chenopodium album L. Rare. Right-of-way. 1M.

PHYTOLACCACEAE

Phytolacca americana L. Common but scattered. Essentially any open disturbed area.

CARYOPHYLLACEAE

Stellaria media (L.) Cyrillo. Abundant along damp roadsides throughout the swamp.

CERATOPHYLLACEAE

Ceratophyllum echinatum Gray. Rare. Submergent in shallow water at 4C.

NYMPHAEACEAE

Nuphar luteum (L.) Sibthorp & Smith. Infrequent in shallow ditches along U.S. 158 and at 4D.

RANUNCULACEAE

Clematis viorna L. Rare. Roadside. 1G.

Ranunculus abortivus L. Infrequent. Low woods. 1E, 1J, 1K, and 3F.

BERBERIDACEAE

Podophyllum peltatum L. Rare. Beech stand at 3B.

MAGNOLIACEAE

Liriodendron tulipifera L. Common at drier sites. 1A, 1C, 1E, 1I, 1K, 2C, 3B, 3E, 4B, and 5B.

Magnolia grandiflora L. Rare. Two small trees. Sherrill Ditch and East Ditch.

M. virginiana L. Abundant, especially along roads. 1A, 1C, 1E, 1F, 1H, 1I, 1J, 1K, 1L, 1M, 2B, 2C, 2E, 3C, 3E, 3F, 4A, 4D, and 5B.

ANNONACEAE

Asimina triloba (L.) Dunal. Especially common on peaty soils but found throughout the swamp. 1C, 1E, 1H, 1I, 2C, 3C, 3E, 4B, and 5B.

LAURACEAE

Persea borbonia (L.) Spreng. (incl. *P. palustris*). One of the most abundant shrubs, especially along roads. 1A, 1E, 1I, 1L, 2B, 2C, 3C, 3E, 4A, 4B, and 5B.

Sassafras albidum (Nutt.) Nees. Infrequent. Drier sites. 1A, 1D, 1K, 2B, 3B, and 5B.

BRASSICACEAE

Lepidium virginicum L. Rare. Weedy field. 1D.

Brassica napus L. Rare. Weedy roadside of Jericho Ditch Lane.

Cardamine hirsuta L. Common and abundant along roads throughout the swamp. 1D, 1H, 1J, 1M, 1F, and 4C. Also along Headley Ditch near state line.

SAXIFRAGACEAE

Decumaria barbara L. Common throughout the swamp but seldom flowering except in full sun. 1E, 1I, 2C, 2E, 3C, 3E, 4B, 4D, and 5B.

Itea virginica L. Common in cypress-gum stands. 1C, 1E, 2A, 2D, 2E, 3C, 3E, 4B, 4C, and 5A.

HAMAMELIDACEAE

Hamamelis virginiana L. Rare. Beech stand. 3D.

Liquidambar styraciflua L. Infrequent. Drier sites. 1A, 1C, 1K, 1M, and 5B.

PLATANACEAE

Platanus occidentalis L. Infrequent. Margins of cypress-gum swamps. 1C, 1E, 1I, 2A, 3C, and 5A.

ROSACEAE

Amelanchier canadensis (L.) Med. Common. Roadsides and other habitats. 1C, 1K, 1M, 2B, and 5B.

Aronia arbutifolia (L.) Ell. (*Sorbus arbutifolia* (L.) Heyn.). Rare. 2B.

Crataegus marshallii Eggl. Single tree at junction of Sycamore and Myrtle Ditches.

C. phaenopyrum (L.f.) Med. Infrequent. Drier sites throughout the swamp including 1C, 1K, and 2C.

Duchesnea indica (Andrz.) Focke. Common along roadsides throughout the swamp including 1D, 1F, 1H, 1J, and 4C.

Fragaria virginiana Duchesne. Infrequent. Open sunny areas along Jericho Ditch Lane and field at fire tower.

Potentilla canadensis L. Rare. Roadside, Jericho Ditch Lane.

Prunus angustifolia Marsh. Small population along Jericho Ditch Lane.

P. persica (L.) Batsch. Single small tree. Jericho Ditch Lane.

P. serotina Ehrh. Rare. Roadside. Jericho Ditch Lane.

Rosa palustris Marshall. Common. Open areas, especially banks of ditches.

Rubus argutus Link. Common in disturbed and open areas. 1A, 1L, 2B, 3F, and 4A.

R. cuneifolius Pursh. Common in disturbed and open areas including 1A, 1L, 2B, 3F, 4A, and 5B.

R. hispidus L. Infrequent. Edge of Washington Ditch near west boundary of refuge. 1C, 3B, and 3D.

Spiraea tomentosa L. Rare. Burned area north of Sycamore Ditch just west of Dismal Swamp Canal.

FABACEAE

Cassia fasciculata Michx. Abundant along roads in dry, open situations.

Lespedeza cuneata (Dumont) G. Don. Infrequent along roads. Badger Ditch near Middle Ditch. Railroad Ditch near Western boundary of refuge.

Trifolium pratense L. Rare. Open field near fire tower.

T. repens L. Rare. Camping area near locks of Feeder Ditch.

LINACEAE

Linum virginianum L. Rare. Roadside. Lynn Ditch near Washington Ditch.

OXALIDACEAE

Oxalis dilleni Jacq. Common along all roads in sunny, open habitats.

GERANIACEAE

Geranium carolinianum L. Rare. Open weedy area. 1D.

EUPHORBIACEAE

Acalypha rhomboidea Raf. Infrequent in drier soil in open, sunny areas. 1D, 1L, 2B, and 4A.

Euphorbia maculata L. Infrequent. Roadsides in open areas. Very abundant in areas which have been logged as 4A.

CALLITRICHACEAE

Callitriche heterophylla Pursh. Infrequent submergent of shallow water. 1J and 1F.

ANACARDIACEAE

Rhus copallina L. Common along roads and at 1A, 1D, 1L, 1F, 1H, 2A, and 5B.

R. radicans L. Ubiquitous vine throughout the swamp.

R. vernix L. Infrequent. Roadsides. Corapeake Ditch near recent railhead. West Ditch just south of Interior Ditch. Scott Ditch near North Ditch.

CYRILLACEAE

Cyrilla racemiflora L. Rare. Small population at 2A.

AQUIFOLIACEAE

Ilex coriacea (Pursh) Chapm. Rare. Apparently the northern limit of this species. 1C.

I. decidua Walt. Infrequent. Recent railhead on Corapeake Ditch. Border of field at fire tower. Also 4A.

I. glabra (L.) Gray. Common roadside shrub. Also abundant in recent burns as 2B.

I. opaca Aiton. Common, but best developed in mature forests. 1C, 1I, 2C, 3B, and 3D.

I. verticillata (L.) Gray. Rare. Swamp forest SE of Railroad Ditch.

CELASTRACEAE

Euonymus americanus L. Infrequent. Roadside West Ditch just north of Interior Ditch. Washington Ditch at Lynn Ditch. Also 1C.

ACERACEAE

Acer rubrum L. Ubiquitous. The most abundant tree in the swamp.

BALSAMINACEAE

Impatiens capensis Meerb. Infrequent. Margins of intermittent pools. 1C, 1H, 1J, and 3E.

I. pallida Nutt. Rare. Highway 17 at Wallaceton.

RHAMNACEAE

Berchemia scandens (Hill) K. Koch. Common. 1C, 1E, 1I, 1L, 2C, 2E, 3C, 3E, 4B, and 4D.

VITACEAE

Parthenocissus quinquefolia (L.) Planch. Infrequent in drier areas. 1C, 1K, 1M, and 5B.

Vitis labrusca L. Often with the above species. Abundant throughout the swamp.

V. rotundifolia Michx. Abundant throughout the swamp.

THEACEAE

Stewartia malacodendron L. Infrequent on drier, usually sandy sites. 1C and 3D. Also north of U.S. 460, City of Portsmouth, Virginia.

HYPERICACEAE

Hypericum hypericoides (L.) Crantz. Common on roadbanks throughout the swamp.

H. mutilum L. Common along roads. 1A, 1B, 1D, 1F, 1H, 1J, 1L, 2B, 3F, 4A, and 4C.

H. walteri Gmelin. Rare. Decaying stump in Lake Drummond south of Interior Ditch.

H. virginicum L. Infrequent. Usually found in decaying stumps in water. 1F, 1G, 1J, 2D, and 5A.

VIOLACEAE

Viola papilionacea Pursh. Rare. Roadside. Hamburg Ditch near Sherrill Ditch.

V. primulifolia L. Infrequent. Roadsides. 1J, 1F, and 1K.

PASSIFLORACEAE

Passiflora incarnata L. Infrequent. Roadside along Feeder Ditch 2.0 miles east of Lake Drummond. Banks of Dismal Swamp Canal along U.S. 17 at Feeder Ditch.

LYTHRACEAE

Decodon verticillatus (L.) Ell. Infrequent. Shallow waters of Lake Drummond, 1G and 2D. South of Interior Ditch. Margin of ditch west of canal, 4D.

MELASTOMATACEAE

Rhexia virginica L. Rare. Bank of Dismal Swamp Canal, just south of state line, Camden Co., North Carolina.

R. mariana L. Common. Roadsides, ditch banks, and power lines. 1D, 1F, 1H, 1J, 1M, 2B, 3F, and 4A.

ONAGRACEAE

Ludwigia alternifolia L. Common. Roadsides. 1D, 1J, 2A, 3F, 1L, and 4A.

L. decurrens Walt. Rare. Margin of Lake Drummond south of Feeder Ditch. City of Chesapeake.

L. glandulosa Walt. Rare. 1M.

L. linearis Walt. Rare. Margin of Lake Drummond south of Feeder Ditch. City of Chesapeake.

L. palustris (L.) Ell. Common. Shallow water of all ditches, usually in full sun. 1F, 1H, 1J, 2A, 3A, 3F, 4B, 4C, and 5A.

HALORAGACEAE

Proserpinaca palustris L. Common. Shallow water and margins of ditches and pools. 1B, 1F, 1H, 1J, 1M, 2B, 3A, 3F, 4B, 4C, and 5A.

Myriophyllum heterophyllum Michx. Not seen by authors but several specimens at US.

ARALIACEAE

Aralia spinosa L. Common and abundant. Along all roads.

APIACEAE

Chaerophyllum tainturieri Hook. Infrequent. Roadsides, 1D and 1J. Jericho Ditch near fire tower.

Daucus carota L. Common. Open, sunny area. 1J and 1L. Roadsides throughout the swamp.

Eryngium prostratum Nutt. Rare. Moist ditchbank. 1K.

Foeniculum vulgare Miller. Rare. Road along Feeder Ditch near Highway 17.

Hydrocotyle umbellata L. Infrequent. Low wet areas. 1H, 1J, 1F, and 1C.

Sanicula canadensis L. Rare. 1C.

NYSSACEAE

Nyssa aquatica L. Common. Swamp forests with cypress. 2E, 3C, 3E, 4B, 4C, 4D, and 5A.

N. sylvatica var. *biflora* (Walt.) Sarg. Common throughout the swamp, including Lake Drummond. 2E, 2C, 2F, 2I, 3C, 3F, 4B, 4D, and 5A.

CORNACEAE

Cornus alternifolia L. f. Rare. 3D.

C. florida L. Infrequent. Drier sites. 1A, 1K, 2D, 3B, and 5B.

CLETHRACEAE

Clethra alnifolia L. Common and abundant. This is perhaps the most abundant shrub throughout the swamp.

ERICACEAE

Chimaphila maculata (L.) Pursh. Infrequent. Mesic areas. 1C, 1K, 3B, and 3D.

Gaultheria procumbens L. Rare. Cedar stand, 1.1 mi. s. of Corapeake Ditch.

Kalmia angustifolia L. Rare. Few plants at 2B.

K. latifolia L. Rare. Junction of Scott and North Ditches. Possibly planted at this site but native in region.

Lyonia ligustrina (L.) DC. Infrequent. Ditch margins. 1E and 1F.

L. lucida (Lam.) K. Koch. Infrequent. 1C and 1F. Also spectacular stands along Jericho and Lynn Ditches.

Leucothoë axillaris (Lam.) D. Don. Frequent. Drier sites. 1C, 1K, 3B, 3D, and 5B.

L. racemosa (L.) Gray. Infrequent. Margins of intermittent pools in cypress-tupelo stands. 2E, 3C, and 4B.

Monotropa uniflora L. Infrequent. North of junction of Lynn and Jericho Ditches. 3D and 5B.

Oxydendrum arboreum (L.) DC. Infrequent. Drier sites. 1C, 1K, 1B, and 5B.

Rhododendron atlanticum (Ashe) Rehder. Infrequent. Roadsides. 1C, 2A, and 3F.

R. nudiflorum (L.) Torrey. Infrequent. Widely scattered throughout the swamp. 1C and 1H. Also Lynn Ditch at Jericho Ditch.

Vaccinium stamineum L. Rare. Small population at 1C.

V. corymbosum L. Infrequent. Roadsides. 1J and 1K. Also Jericho Ditch Lane.

V. tenellum Ait. Rare. 1M.

EBENACEAE

Diospyros virginiana L. Infrequent. Drier sites. 1K, 1M, 3B, and 3D.

SYMPLOCACEAE

Symplocos tinctoria (L.) L'Her. Infrequent. Drier sites. 3B and 3D. Scott at North Ditch.

OLEACEAE

Fraxinus caroliniana Mill. Infrequent. Margins of streams. 1J, 1F, and 5A.

F. tomentosa Michx. f. Rare. 1J.

F. pennsylvanica Marsh. Infrequent. Drier sites. 1C, 1I, 2C, and 3D.

Ligustrum sinense Lour. Frequent. Widely scattered along roadsides throughout the swamp.

LOGANIACEAE

Gelsemium sempervirens (L.) Ait. f. This woody vine is ubiquitous throughout the swamp.

Polypremum procumbens L. Rare. Weedy field. 1D.

GENTIANACEAE

Bartonia virginica (L.) BSP. Rare. Old field. 1A.

Gentiana saponaria L. Rare. Edge of Railroad Ditch at refuge boundary.

APOCYNACEAE

Apocynum cannabinum L. Frequent. Roadsides, 1J. Jericho Ditch, Williamson Ditch, and Washington Ditch.

Vinca minor L. Rare. Weedy field. 1D.

VERBENACEAE

Callicarpa americana L. Rare. Roadside. Corapeake Ditch.

Verbena urticifolia L. Rare. Roadsides. Interior Ditch.

LAMIACEAE

Glechoma hederacea L. Infrequent. 1C and roadside, Hamburg Ditch.

Prunella vulgaris L. Common along roadsides.

Salvia lyrata L. Infrequent. Roadsides. 1D and 1J.

Scutellaria integrifolia var. *integrifolia* L. Rare. Roadsides. Railroad Ditch.

Stachys hyssopifolia Michx. Rare. Roadsides. Hamburg Ditch.

Teucrium canadense L. Rare. Roadside. Hamburg Ditch.

SOLANACEAE

Solanum carolinense L. Rare. Dry roadsides. West Ditch.

SCROPHULARIACEAE

Agalinis purpurea (L.) Pennell. Infrequent. Open, sunny areas. 1M and 1J.

Chelone glabra L. Rare. Roadbank. Washington Ditch.

Gratiola neglecta Torr. Rare. Small pool in old logging road 1.0 mile north of U.S. 158, 0.5 mile east of Gates County line.

Paulownia tomentosa (Thunb.) Steud. Infrequent. Small trees. Washington Ditch and Corapeake Ditch.

Verbascum thapsus L. Infrequent. Roadsides. 1C, 1M, and 1J.

Veronica arvensis L. Infrequent. Roadsides, 1C. Also Jericho Ditch Lane.

BIGNONIACEAE

Anisostichus capreolata (L.) Bureau. Ubiquitous throughout the swamp.

Campsis radicans (L.) Seem. Common. Usually in drier areas. 1A, 1C, 1J, 1K, 1L, 1M, 3D, 4D, and 5B.

OROBANCHACEAE

- Conopholis virginiana* (L.) Wallr. Rare. Beech stand. 3D.
Epifagus virginiana (L.) Bart. Frequent. Always with beech. 1C, 1K, 3B, and 3D. Also beech stands north of U.S. 460 east of Old Norfolk Road.

LENTIBULARIACEAE

- Utricularia biflora* Lam. Rare. Ditch north of U.S. 158.
U. gibba L. Rare. Shallow waters of Myrtle Ditch.
U. inflata Walt. Rare. Ditch north of U.S. 158.
U. purpurea Walt. Infrequent. Waters of Lynn, Portsmouth, Washington and Interior Ditches.

PLANTAGINACEAE

- Plantago aristata* Michx. Rare. Hamburg Ditch Road.
P. lanceolata L. Rare. Weedy field. 1D.
P. virginica L. Rare. Weedy area. 1D.

RUBIACEAE

- Cephalanthus occidentalis* L. Infrequent. Usually in standing water. 1F, 1G, and 1D.
Diodea teres Walt. Rare. Roadsides. Jericho Ditch Lane.
D. virginiana L. Frequent. Usually in roads in full sun. Jericho Ditch Lane, Lynn Ditch, Hudnall Ditch, and North Ditch.
Houstonia caerulea L. Infrequent. Edges of road 604 near 1K and Jericho Ditch north of Hudnall Ditch.
Mitchella repens L. Infrequent. Drier sites. 1C, 3B, and 3D.

CAPRIFOLIACEAE

- Lonicera japonica* Thunb. Common everywhere except in the very wettest situations.
L. sempervirens L. Rare. Jericho Ditch Lane near 1D.
Sambucus canadensis L. Common. Open, sunny moist areas. 1F, 1H, 1J, 2A, 2B, 3A, 3F, and 4C.
Viburnum nudum L. Rare. Margin of Laurel Ditch south of Sycamore Ditch. Swamp forest 4B.

VALERIANACEAE

- Valerianella radiata* (L.) Dufr. Infrequent. Weedy roadside, 1J, along U.S. 158.

CAMPANULACEAE

- Lobelia cardinalis* L. Infrequent. 1J and 3A.
L. nuttallii R. & S. Rare. Wet roadside. 1J.
Specularia perfoliata (L.) A. DC. Rare. Weedy area. 1D.

ASTERACEAE

- Achillea millefolium* L. Rare. Roadside. Jericho Ditch Lane. 1D.
Ambrosia artemisiifolia L. Rare. Power line cut. 1M.
Aster pilosus Willd. Rare. Power line. 1M.
Baccharis halimifolia L. Infrequent. Roadside, Corapeake Ditch.
 Power line. 1M.
Bidens frondosa L. Rare. Power line. 1M.
Carduus spinosissimus Walt. Rare. Roadside. Laurel Road south
 of Persimmon Road.
Crepis japonica (L.) Benth. Infrequent. Roadsides at junction
 of Jericho and Hudnall Ditches. Also 3F.
Elephantopus tomentosus. Rare. Roadside. Jericho Ditch Lane.
Erechtites hieracifolia (L.) Raf. Parking lot, fire tower.
Erigeron annuus (L.) Pers. Frequent. Roadsides throughout the
 swamp.
Eupatorium capillifolium (Lam.) Small. Common. This species
 forms an almost continuous border along drier parts of most
 roads.
E. coelestinum L. Common. Open roadsides. 1M. Jericho, Cora-
 peake, and Lynn Ditches.
E. hyssopifolium L. Rare. Power line. 1M.
E. maculatum L. Power line. 1M
E. rotundifolium L. Rare. Power line. 1M.
Gnaphalium obtusifolium L. Infrequent. Edge of Williamson
 Ditch. Also 1D.
Helenium amarum (Raf.) H. Rock. Rare. Power line. 1M.
Hypochoeris radicata L. Rare. Roadside. Jericho Ditch Lane
 near junction with Jericho Ditch.
Mikania scandens (L.) Willd. Rare. Open roadside. 1J.
Pluchea camphorata (L.) DC. Rare. Open roadside. 1J.
Pyrrhopappus carolinianus (Walt.) DC. Rare. Weedy areas. 1D.
Senecio tomentosus Michx. Infrequent. Roadside. Railroad Ditch
 near Interior Ditch, open area, 1D.
Solidago erecta Pursh. Rare. Power line. 1M.
Taraxacum officinale Weber. Frequent. Weedy areas, 1D. Field
 near fire tower, 1M. Also Interior Ditch.

ACKNOWLEDGMENTS

We wish to acknowledge the invaluable assistance of the staff of the Dismal Swamp National Wildlife Refuge, particularly

M. K. Garrett, for providing access and transportation into the "remoter fastnesses" of the swamp by four-wheel-drive vehicles and boats. Several private landowners and corporations granted us permission to work on their property including S. Kirk, E. Daniels and Weyerhaeuser Company, Atlantic Farms, Inc., and Big Entry Hunt Club. We are indebted to Dr. Warren H. Wagner, Jr., for providing us with unpublished data on pteridophytes of the swamp. Field work during the summer of 1975 was supported in part by NSF grant EPP75-04303. This generous support is gratefully acknowledged. Dr. Alton M. Harvill, Jr. read a draft of the manuscript and made helpful suggestions.

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"A later trip would doubtless reveal many more species, but with the drawback of possible chills and certain yellow flies and mosquitoes."

J. W. Chickering, Jr., 1874

“The flora of the swamp, it must be confessed, is rather tame and monotonous; but if it were possible to penetrate into the remoter fastnesses, many new names would doubtless be added to systematic botany.”

B. McCarthy, 1884

“It is very certain that a well-equipped botanical expedition would find much of interest in the unexplored parts of this particular region.”

C. L. Pollard, 1896

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